

Upper Mississippi valley.—1st to 28th.
Missouri Valley.—1st to 28th.
Northern slope.—1st to 28th.
Middle slope.—1st to 28th.
Southern slope.—3d to 6th, 8th, 9th, 11th to 15th, 17th to 28th.
Southern plateau.—1st to 5th, 7th to 28th.
Middle plateau.—1st to 28th.
Northern plateau.—1st to 28th.
North Pacific coast region.—1st to 28th.
Middle Pacific coast region.—2d, 3d, 5th, 6th, 7th, 10th, 14th to 20th, 22d, 23d, 25th to 28th.
South Pacific coast region.—Riverside, California, 3d, 4th, 5th, 11th, 12th, 17th, 18th, 20th, 21st, 23d, 24th; Fall Brook, California, 3d, 4th, 12th, 17th, 21st; Los Angeles, California, 4th, 21st to 25th; San Diego, California, 17th, 19th.

ICE.

Ice formed on calm water in the southern districts of the country on the following dates:

Arizona.—Maricopa, 21st, 23d.
California.—Sacramento, 3d, 7th, 16th, 19th, 25th, 26th; San Francisco, 20th, 22d, 25th, 26th; San Diego, 19th; Nicolaus, 25th.
Texas.—San Antonio, 4th.

LOW TEMPERATURES.

Fort Assinaboine, Montana: on the 2d the barometer was high, and almost stationary; mean reduced for the day 30.79, which is the highest on record at this station; on the night of the 2-3d the minimum thermometer registered $-55^{\circ}.4$; this is the lowest temperature on record at this station. Reports from the cattle ranges state that many cattle were dying from the effects of extreme cold weather. Stage coaches were delayed three or four days on account of deep snow drifts. The observer at Fort Maginnis, Montana, states that on the 2d and 3d very high pressure, with heavy northwest winds and low temperature, prevailed; minimum on the 2d $-42^{\circ}.0$, the lowest known at this place. In the vicinity of Fort Maginnis, and over the entire territory, large numbers of cattle perished from cold and starvation. At Poplar River, Montana, the temperature on the 2d was $-26^{\circ}.0$, and on the 3d $-44^{\circ}.6$, with strong westerly winds prevailing. Numbers of cattle in the vicinity perished from cold.

PRECIPITATION.

[Expressed in inches and hundredths.]

The distribution of precipitation over the United States and Canada for February, 1887, as determined from the reports of about six hundred stations, is exhibited on chart iii, and in the table of miscellaneous data are given, for Signal Service stations, the total precipitation, with the departures from the normal.

The precipitation for February, 1887, is above the normal in all parts of the United States, except South Carolina, Georgia, Florida, Louisiana, Montana, and parts of Texas, Arkansas, Washington Territory, and Oregon. The excess is especially large in California and southern Oregon; in the former state the precipitation of the month is about twice the usual amount for February. A large part of this excessive precipitation fell on the 3d-4th, 8-9th, and 14th, a number of stations in California reporting on these dates a fall of over two inches, and several of over three inches, in twenty-four hours. The excess is also large in the Lake region and Ohio Valley, in the former district the precipitation of the month is more than twice the normal amount, a considerable part of this fell during the prevalence of low-area number v on the 10th and 11th; on those days a number of stations reported a fall of over two inches in less than thirty-six hours. The greatest deficiency of rainfall occurs in Florida, where the amount for the month is very small, few stations reporting over 0.90.

The following are some of the most marked departures from the normal precipitation at Signal Service stations:

Above normal.		Below normal.	
	Inches.		Inches.
Los Angeles, California.....	5.75	Portland, Oregon.....	4.58
Sandusky, Ohio.....	5.62	Olympia, Washington Territory.....	4.52
San Francisco, California.....	5.60	Hatteras, North Carolina.....	3.57
Port Huron, Michigan.....	5.40	Cedar Keys, Florida.....	3.19
Erie, Pennsylvania.....	5.24	Jacksonville, Florida.....	3.06
Cleveland, Ohio.....	5.10	Charleston, South Carolina.....	1.30
Toledo, Ohio.....	4.96	Norfolk, Virginia.....	1.29

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows, for certain stations, as reported by voluntary observers, the average precipitation for the month of February for a series of years, the precipitation for February 1887, and the departures from the average:

Station.	County.*	Average precipitation for Feb.	Number of years.	Precipitation for Feb., 1887.	Departure.
		Inches.		Inches.	Inches.
<i>Arkansas.</i>					
Lead Hill.....	Boone.....	6.43	5	4.68	- 2.35
<i>California.</i>					
Fall Brook.....	San Diego.....	3.74	12	5.65	+ 1.91
Sacramento.....	Sacramento.....	3.19	21	5.89	+ 2.70
Santa Barbara.....	Santa Barbara.....	3.89	20	5.64	+ 4.75
<i>Connecticut.</i>					
Canton *.....	Hartford.....	3.84	25	5.37	+ 1.53
Hartford *.....	Hartford.....	3.72	15	5.62	+ 1.90
Middletown *.....	Middlesex.....	4.15	29	7.56	+ 3.41
Wallingford *.....	New Haven.....	4.35	29	7.16	+ 2.81
<i>Florida.</i>					
Archer.....	Alachua.....	2.74	4	0.38	- 2.36
<i>Illinois.</i>					
Collinsville.....	Madison.....	3.04	5	4.60	+ 1.56
Mattoon.....	Coles.....	5.15	7	4.25	- 0.90
Peoria.....	Peoria.....	2.15	31	5.45	+ 3.30
Riley.....	McHenry.....	1.68	24	4.82	+ 3.16
Sycamore.....	De Kalb.....	2.82	6	4.50	+ 1.68
<i>Indiana.</i>					
Lafayette.....	Tippecanoe.....	3.53	8	2.94	- 0.59
Logansport.....	Cass.....	2.75	33	5.15	+ 2.40
Mauzy.....	Rush.....	4.89	7	6.28	+ 1.39
Vevay.....	Switzerland.....	3.65	21	8.28	+ 4.63
<i>Iowa.</i>					
Cresco.....	Howard.....	0.95	15	1.88	+ 0.93
Monticello.....	Jones.....	1.92	34	4.62	+ 2.70
Muscatine.....	Muscatine.....	1.77	40	4.12	+ 2.35
<i>Kansas.</i>					
Independence.....	Montgomery.....	2.17	15	1.55	- 0.62
Wellington.....	Sumner.....	1.12	9	1.18	+ 0.06
<i>Maine.</i>					
Gardiner *.....	Kennebec.....	3.59	49	5.62	+ 2.03
Orono *.....	Penobscot.....	3.99	19	5.89	+ 1.90
<i>Maryland.</i>					
Fallston.....	Harford.....	4.00	16	4.46	+ 0.46
<i>Massachusetts.</i>					
Cambridge *.....	Middlesex.....	3.60	46	4.96	+ 1.36
Chestnut Hill *.....	Middlesex.....	4.44	12	4.44	0.00
Framingham *.....	Middlesex.....	4.14	13	5.07	+ 0.93
Lake Cochituate *.....	Middlesex.....	3.65	36	5.34	+ 1.69
Lynn *.....	Essex.....	3.94	13	4.98	+ 1.04
Mythic Lake *.....	Middlesex.....	4.15	12	4.43	+ 0.28
New Bedford *.....	Bristol.....	3.28	74	6.25	+ 2.97
Somerset.....	Bristol.....	3.63	17	3.92	+ 0.29
Springfield *.....	Hampden.....	3.53	40	5.23	+ 1.70
Waltham *.....	Middlesex.....	2.71	58	4.66	+ 1.95
Williamstown *.....	Berkshire.....	2.59	21	4.50	+ 1.91
<i>Nevada.</i>					
Carson City.....	Ormsby.....	1.43	8	3.27	+ 1.84
<i>New Brunswick.</i>					
Saint John *.....	Saint John.....	4.77	17	7.60	+ 2.83
<i>New Hampshire.</i>					
Concord *.....	Merrimac.....	2.66	31	4.86	+ 2.20
Hanover *.....	Grafton.....	2.11	22	7.67	+ 5.56
<i>New Jersey.</i>					
South Orange.....	Essex.....	3.75	17	5.07	+ 1.32
<i>New York.</i>					
Factorville.....	Tioga.....	2.05	5	2.88	+ 0.83
Menand's.....	Albany.....	2.16	4	3.40	+ 1.24
Palermo.....	Oswego.....	2.93	33	2.03	- 0.90
<i>Ohio.</i>					
Wauseon.....	Fulton.....	2.77	13	7.19	+ 4.42
<i>Pennsylvania.</i>					
Dyberry.....	Wayne.....	2.85	18	4.89	+ 2.04
<i>South Carolina.</i>					
Kirkwood.....	Kershaw.....	3.46	20	2.27	- 1.19
Stateburg.....	Sumter.....	2.21	6	1.89	- 0.32
<i>Texas.</i>					
New Ulm.....	Austin.....	4.53	15	2.60	- 2.53
<i>Vermont.</i>					
Lunenburg *.....	Essex.....	2.91	39	3.80	+ 0.89
Newport *.....	Orleans.....	2.89	12	4.75	+ 1.86
Strafford.....	Orange.....	3.04	12	5.90	+ 2.86
<i>Virginia.</i>					
Bird's Nest.....	Northampton.....	3.61	18	3.85	+ 0.24
Dale Enterprise.....	Rockingham.....	3.47	7	4.72	+ 1.25
Variety Mills.....	Nelson.....	3.61	8	3.91	+ 0.30
Wytheville.....	Wythe.....	3.32	22	3.50	+ 0.18
<i>West Virginia.</i>					
Helvetia.....	Randolph.....	4.80	10	7.68	+ 2.88

* From the "Bulletin of the New England Meteorological Society."

The following notes, in connection with this subject, are furnished by voluntary observers:

Arkansas.—Lead Hill, Boone county: the precipitation of the past winter, 6.92, is the least that has fallen in any winter during the past six years, and is 6.91 below the average.

California.—Santa Barbara, Santa Barbara county: the total precipitation of the past winter, 11.07, is 1.84 below the average for the same period during the past twenty years.

Illinois.—Riley, McHenry county: the total precipitation of the winter of 1886-'87, 9.54, is 8.95 more than the mean of twenty-three winters past; it is also the greatest amount that has fallen in any winter during that time.

Indiana.—Mauzy, Rush county: the precipitation of February, 1888, 8.81, is the greatest, and that of 1886, 1.14, the least that has fallen in February during the past seven years.

Maryland.—Fallston, Harford county: the largest February precipitation in the past sixteen years, 7.01, occurred in 1884; the least, 1.50, in 1872.

Massachusetts.—Worcester, Worcester county: the precipitation of the month was unusual. There were twelve days on which 0.01 or more of rain or melted snow fell. On the 18th there was a heavy thunder shower. The aggregate of rain and melted snow was 4.89, or more than an inch above the average. There were nine snow storms, with an aggregate fall of 15.27, or nearly 4.00 more than the average, while the aggregate snowfall this winter is 70.27.

Nevada.—Carson City, Ormsby county: the total rainfall and melted snow of the past winter, 5.95, is 1.39 below the average.

New Jersey.—South Orange, Essex county: the total precipitation of the winter of 1886-'87, 12.12, is 0.78 in excess of the winter average of the past seventeen years.

New York.—Palermo, Oswego county: during the past thirty-three years the largest February snowfall, 58.00, occurred in 1866; the least, 1.00, in 1877.

Ohio.—Portsmouth, Scioto county: the month was remarkable for its heavy rainfall, total, 9.28; during the past twenty-seven years this amount has been exceeded once only, viz., 10.59, in May, 1865.

Texas.—New Ulm, Austin county: during the past fourteen years the greatest February precipitation occurred in 1882, total, 10.94; the least in 1885, total, 1.06.

Vermont.—Poultney, Rutland county: the snowfall of this vicinity since November 7, 1886, is unprecedented; total amount, 117.8 inches.

In the following table are shown, for the several geographical districts, the normal precipitation for February, the average for February, 1887, and the excess or deficiency, as compared with the normal:

Average precipitation for February.

Districts.	Average for Feb., Signal-Service observations.		Comparison of Feb., 1887, with the average for several years.
	For several years.	For 1887.	
	Inches.	Inches.	Inches.
New England.....	4.20	4.91	+ 0.71
Middle Atlantic States.....	3.46	3.75	+ 0.29
South Atlantic States.....	3.70	2.55	- 1.15
Florida Peninsula.....	2.75	0.63	- 2.12
Eastern Gulf States.....	4.73	5.45	+ 0.72
Western Gulf States.....	4.34	3.78	- 0.56
Rio Grande Valley.....	1.48	0.66	- 0.82
Tennessee.....	5.20	7.67	+ 2.47
Ohio Valley.....	2.58	6.18	+ 3.61
Lower lake region.....	1.99	3.41	+ 1.42
Upper lake region.....	0.73	0.55	- 0.18
Extreme northwest.....	2.21	3.34	+ 1.13
Upper Mississippi Valley.....	0.86	1.17	+ 0.31
Missouri Valley.....	0.78	0.57	- 0.21
Northern slope.....	0.57	0.20	- 0.37
Middle slope.....	0.92	0.42	- 0.50
Southern slope.....	1.30	1.19	- 0.11
Southern plateau.....	1.76	1.48	- 0.28
Middle plateau.....	2.44	1.54	- 0.90
Northern plateau.....	6.76	4.44	- 2.32
North Pacific coast region.....	3.44	6.91	+ 3.47
Middle Pacific coast region.....	2.13	4.59	+ 2.46
South Pacific coast region.....			

SNOW.

Fort Buford, Dakota: on the 1st heavy snow, accompanied by an easterly gale, fell from 5.07 to 11.20 p. m., causing deep drifts which blockaded all roads. Reports from Fargo, Jamestown, and numerous other places throughout the territory, speak of heavy snows and high winds, with extremely low temperature, as prevailing during the first part of the month. Great losses have been incurred by cattlemen, the stock perishing from the effects of cold and lack of food, the dead grass upon which they feed during the winter being covered to a greater depth than usual with crusted snow. The continued succession of "blizzards" and deep snows, with very low tem-

peratures even for this region, have been disastrous to every interest, especially along the line of the Northern Pacific Railroad in Dakota and Montana, where heavy mortality among cattle has occurred.

Huron, Dakota: owing to the heavy snow storms and high winds that prevailed during the first decade of the month many trains on the Chicago and Northwestern Railroad were delayed. On the 11th the road to the eastward of Huron became completely blockaded by heavy compact snow, and on the 13th no trains arrived from any direction. The road between Huron and Chicago remained blockaded until the end of the month; on the 28th the railroad officials stated that it would probably be two weeks before the road could be opened toward the east, the snow drift being too compact to yield to the force of the snow plows.

San Francisco, California: heavy rain fell during the night of the 4-5th and until 5.50 a. m. of the 5th, when light snow began falling; from 6.25 until 8.10 a. m. the snowfall was very heavy. Snow and rain fell until 2.45 p. m.; from that hour until 5.20 p. m. light snow fell. At 12.45 p. m. the snow in the eastern part of the city was 3.7 inches in depth; in the western part the depth was fully seven inches, and did not all disappear until the afternoon of the 7th. The storm was accompanied by low temperature, the minimum, 33° 1, being the lowest on record since the establishment of a signal office at San Francisco. The observer reports this to be the heaviest snowfall on record for this place.

Oroville, Butte county, California: the voluntary observer at this place gives the following statement in regard to heavy snowfall in that vicinity:

On the 3d a snow storm commenced in the mountains, and, with but slight cessation, raged for ten days. This has been the most severe storm experienced since the winter of 1867-'68. Much damage has been done from the great weight of snow crushing in houses and barns. The table below will give some idea of the severity of this storm, with the depth of snow in the several places named, and altitude above sea level:

	Miles from Oroville.	Depth of snow, Feb. 13th.	Elevation above sea-level.
		Feet.	Feet.
Oroville.....	0	0.0	171
Berry Creek.....	18	1.0	1,760
Galena Ranch.....	22	3.0	2,500
Mount Cottage.....	26	5.0	3,400
Mount House.....	27	6.5	2,500
Merrimac Mills.....	33	7.5	3,961
Buckeye.....	35	9.5	4,500
Forbestown.....	22	5.5	2,770

Durango, La Plata county, Colorado: during the night of the 16-17th, and on the 17th, high wind and light snow prevailed. At Durango the total fall was only about three inches, but on the adjacent mountains it fell to a depth of sixteen and eighteen inches and drifted badly. A large snow slide occurred in the Animas Cañon, between this town and Silverton, which completely filled the cañon, covering to a depth of more than seven hundred feet a railroad that passed through it.

Saint Paul, Minnesota: light and heavy snow fell on the 14th, 15th, 17th, 18th, and 19th; on the 18th and 19th high winds prevailed, drifting the snow badly and filling railroad cuttings, delaying trains from two to six hours. On the 25th and 26th light snow fell, accompanied by heavy west and north-west winds which caused it to drift badly. Trains on the Sioux City branch of the Omaha Railroad were abandoned, and those on other lines delayed several hours. On the morning of the 26th nearly all lines in the state reported a blockade from snow. In some places the drifts were many feet deep, causing more delay than any previous snow storm this winter.

Marquette, Michigan: during the afternoon of the 17th and night of the 17-18th a heavy snow storm, accompanied by high wind, prevailed; maximum velocity of the wind, thirty-three miles per hour from the east, at 3.04 a. m. This was one of the worst storms of the winter, the snow drifting in places to a depth of from six to twelve feet. Travel of all kinds was impeded and telegraphic communication interrupted. The

Chicago and Northwestern Railroad was blockaded several hours; on the Detroit, Mackinaw, and Marquette Railroad several trains were abandoned.

Roseburg, Oregon: cattlemen in the Umpqua Valley and surrounding country have suffered considerable loss in sheep and cattle during February on account of the heavy snowfall, the total depth for the month at Roseburg being 27.2 inches, which is an unusually large amount for this station.

Saint Vincent, Minnesota: light snow fell on the night of the 24-25th and until midnight of the 25th. On the early morning of the 26th the wind increased in force, and at 5.45 a. m. a gale set in from the northwest and continued until 4.50 p. m., attaining at 2.45 p. m. a velocity of thirty-two miles per hour. The snow which had fallen on the previous day was swept into large drifts, and numerous fences and small buildings were blown down. On the 25th the north bound train reached this place fourteen hours late.

Duluth, Minnesota: light and heavy snow fell on the 23d, 24th, 26th, and 27th; on the 26th the snow was accompanied by a high northwest wind which reached at 11 a. m. a velocity of thirty-two miles per hour, drifting the snow badly and interrupting travel of all kinds. The railroad between Saint Paul and Duluth was completely blockaded by snow, no trains arriving at the latter place until the afternoon of the 28th.

La Crosse, Wisconsin: on the 26th light wind blew from the northwest until 7 a. m., when it suddenly increased in force and during the afternoon blew a gale; maximum velocity twenty-nine miles per hour. The high wind drifted the snow that covered the ground, delaying, and in many cases entirely suspending, railroad traffic.

The dates on which snow fell in the various districts are as follows:

New England.—1st to 11th, 13th to 27th.

Middle Atlantic states.—1st to 8th, 11st to 15th, 18th to 28th.

South Atlantic states.—Stateburg, South Carolina, 1st; Lenoir, North Carolina, 14th.

West Gulf states.—Fort Gibson, Indian Territory, 3d, 11th; Fort Smith, Arkansas, 4th.

Ohio Valley.—1st to 5th, 11th, 12th, 18th to 23d, 24th, 26th, 27th, 28th.

Lower lake region.—1st to 7th, 9th to 13th, 15th to 28th.

Upper lake region.—1st to 28th.

Extreme northwest.—1st to 7th, 9th, 10th, 11th, 13th, 14th, 16th to 20th, 22d, 23d, 25th, 26th, 27th.

Upper Mississippi valley.—1st to 7th, 9th, 10th, 11th, 14th, 15th, 17th to 23d, 25th, 26th.

Missouri Valley.—1st to 11th, 13th to 23d, 25th, 26th.

Northern slope.—1st to 10th, 12th, 13th, 14th, 16th to 26th.

Middle slope.—1st to 7th, 10th, 11th, 13th, 15th to 23d, 25th, 26th.

Southern slope.—3d, 4th, 5th, 11th, 20th.

Middle plateau.—1st to 25th.

Northern plateau.—1st to 27th.

North Pacific coast region.—1st to 14th, 16th to 25th, 28th.

Middle Pacific coast region.—Fort Gaston, California, 1st, 2d, 3d, 7th, 13th, 14th, 20th, 21st, 24th, 25th; Susanville, California, 1st, 2d, 3d, 5th to 9th, 12th to 15th, 19th, 20th, 21st, 24th; San Francisco, Angel Island, Benicia Barracks, Presidio of San Francisco, and Princeton, California, 5th; Salinas, California, 21st.

MONTHLY SNOWFALLS.

[Expressed in inches and tenths.]

The following stations report a monthly snowfall of ten inches or more:

California.—Cisco, 228.5; Summit, 207; Emigrant Gap, 188; Boca, 127; Truckee, 122.5; Towles, 116; Susanville, 88; Fort Bidwell, 49; Tehichipa, 42; Colfax, 38; Keene, 30; Mojave, 16.

Connecticut.—Canton, 22; Collinsville, 20.6; Hartford, 20; Southington, 16.5; New London, 14.5; Middletown, 14; Bethel, 12.8; New Haven, 10.5

Dakota.—Parkston, 17.5; Webster, 16.5.

Illinois.—Lake Forest, 16.8; Windsor, 14; Rockford, 12.5; Waukegan, 11.5; Aurora, 10.8; Cedarville, 10.5; Riley, 10.

Iowa.—West Milton, 10.1.

Maine.—Kent's Hill, 45; Cornish, 43; Lewiston, 37.7; Solan, 35.7; Gardiner, 34.8; Orono, 33.5; Belfast, 25; Portland, 24.9; Eastport, 15.9.

Maryland.—New Midway, 11.

Massachusetts.—Rowe, 37; Gilbertville, 28; Fitchburg, 26.8; Springfield, 24; Newburyport, 23.5; Amherst and Fitchburg, 22.5; Dudley, 22; Ludlow, 21.8; Lawrence, 21.5; Williamstown, 21; Concord, 20.8; Monson, 19.5; Williamstown, 19; Westborough, 18.8; Mansfield and Taunton, 16.2; Worcester, 15.4; Worcester, 15.2; Beverly Farms and Blue Hill Observatory, 15; Fall River, 12.5; Boston, 12; Somerset, 11.8; South Hingham, 11.5; Milton, 11.2; Taunton, 10.

Michigan.—Alpena, 38.1; Traverse City, 33; Harrisville, 31; Mackinaw City, 22.4; Marquette, 15.5; East Saginaw, 15; Escanaba, 10.8; Lansing and Grand Haven, 10.

Minnesota.—Minneapolis, 22.2; Northfield, 21; Mankato, 17.6; Rochester, 15; Albert Lea, 13; Excelsior, 12.4; Saint Cloud and Duluth, 12; Spring Valley, 11; Red Wing, 10.

Montana.—Helena, 11.2; Fort Maginnis, 10.5.

Nebraska.—York, 16.5; Tecumseh, 13.5; Tacoma, 12.5; North Platte, 12.2; Stockham, 11.5; Marquette and Brownville, 10.1.

Nevada.—Carson City, 43; Reno, 29; Wadsworth, 22; Palisade, 21.2; Carlin, 20; Halleck and Hawthorn, 18.5; Hot Springs, 18; Winnemucca, 17.1; Otego, 17; Elko, 16; Toano, 15; Browns, 12.9; Humboldt, 12.5; Beowawe, 12; Battle Mountain, 11.5.

New Hampshire.—Quincy, 50.8; Berlin Mills, 40; Shelburne, 35; Grafton and Hanover, 34; Walpole, 32.1; Concord, 29; Manchester and Stratford, 27; West Milan and Manchester, 26; Nashua, 22.8; Antrim, 22.7; Mount Washington, 15.4.

New Jersey.—Dover, 16.4; Paterson and Roseland, 13; South Orange, 12.5.

New York.—Lebanon Springs, 21.5; Cooperstown, 21; North Concord, 20.8; Menands, 19.9; Rochester, 18.4; Auburn, 16.5; Ithaca, 15.9; Albany, 15.4; Penn Yan and White Plains, 15; Boyd's Corners and Humphrey, 13; Oswego, 12.7; Factoryville, 12.6; New York City, 11.9.

Oregon.—Eola, 32; Roseburg, 27.2; Albany, 26; Portland, 17.9; Astoria, 17.5; La Grange, 11.5; Mount Angel, 10.6.

Pennsylvania.—Dyberry, 23; Zionsville, 15.1; Wellsborough, 14.4; Grampian Hills, 14; Blooming Grove, 13.8; Easton, 13.2; Catawissa, 12.9; State College, 12.5; Erie, 11; Philipsburg and Quakertown, 10.

Rhode Island.—Providence, 14.5; Bristol, 12.8; Olneyville, 12.5; Providence, 12.

Utah.—Salt Lake City, 15.5; Frisco, 14.3; Ogden, 12.8; Corinne, 11.

Vermont.—Strafford, 61; Chelsea, 42.5; Jacksonville, 39.7; Townshend, 37.8; Newport, 36.8; Brattleborough, 35.7; Marlborough, 33.6; Lunenburg, 33; Charlotte, 29.5; Vernon, 28; Poultney, 25.5; Burlington, 21; Post Mills, 16.

Virginia.—Dale Enterprise, 10.

Washington Territory.—Port Angeles, 48.8; Walla Walla, 27; Tatoosh Island, 20.3; Blakely, 19.5; Tacoma, 16.7; Kennewick, 12.6; Fort Canby, 12.5.

Wisconsin.—Green Bay, 28.9; Wausau, 26.5; Embarras, 23.5; Milwaukee, 18.2; Manitowoc, 13.5; Fond du Lac, 12; Delavan and La Crosse, 11.

Wyoming.—Camp Sheridan, 46.5.

DEPTH OF UNMELTED SNOW ON GROUND AT END OF MONTH.

[Expressed in inches and tenths.]

California.—Susanville, 12; Fort Bidwell, 9.

Colorado.—Pike's Peak, 2.

Connecticut.—Hartford, 6; Southington, 5; Bethel, 4; New Haven, 1.5.

Dakota.—Fort Totten, 17; Parkston and Fort Buford, 12; Deadwood, 10; Huron, 6; Highmore, 5; Bismarck, 3.

Illinois.—Sycamore, 2.

Iowa.—West Union, 14; Cresco, 10; Independence, 8 to 12; Monticello and Dubuque, 6; Bancroft, 4; Cedar Rapids, 1.5; Clinton and Muscatine, 1.

Kansas.—Wakefield, trace.
Maine.—Cornish, 48 (in the woods); Portland, 24; Gardiner, 22; Orono, 15; Eastport, 4.
Maryland.—New Midway, 6; Cumberland, 4; Fallston, 2.5; Baltimore, 0.5; Woodstock, trace.
Massachusetts.—Williamstown, 9; Amherst, 6 to 8; Dudley and Worcester, 4; Westborough and Boston, 3; Blue Hill Observatory and Milton, 1; North Truro, trace.
Michigan.—Traverse City, 40; Mackinaw City, 25; Alpena, 20; Escanaba, 15; Marquette, 13; Grand Haven, 7; East Saginaw and Kalamazoo, 5; Swartz Creek, 3 to 10; Detroit and Port Huron, 2; Birmingham, 1; Lansing a, 0.5; Lansing b, trace.
Minnesota.—Saint Vincent, 16; Duluth and Saint Paul, 12; Minneapolis, 4; Moorhead, 3.
Montana.—Poplar River, 15; Fort Maginnis, 10; Helena, 6; Fort Assinaboine, 5.2.
Nebraska.—Valentine, 1; Marquette, trace; Hay Springs, drifts.
Nevada.—Carson City, 8; Winnemucca, 2.
New Hampshire.—Antrim, 23; Mount Washington, 14; Nashua, 6.
New Jersey.—South Orange, 6; Dover, 5; Paterson, 4; Beverly, trace.
New York.—North Volney, 22; Cooperstown, 18; Palermo, 12; Menands, 9; White Plains and Albany, 6; Auburn, 4; Oswego and Factoryville, 3; Humphrey, 2; New York City, 1; Rochester, 0.6; Buffalo, 0.5; Le Roy, trace.
Ohio.—Hiram, 2; Cleveland a, Garrettsville, and Sandusky, 1; Cleveland b and Toledo, 0.5; Wauseon, 0.4; Napoleon, 0.2; Ruggles and Tiffin, trace.
Oregon.—La Grande, 0.5; Albany and Astoria, trace.
Pennsylvania.—Dyberry, 12 to 15; State College and Gram-pian Hills, 6; Quakertown, 5; Zionsville, 4; Wellsborough, 3.7; Catawissa and Phillipsburg, 3; West Chester, 1.2; Pittsburg and Erie, 1.
Utah.—Frisco, trace.
Vermont.—Strafford, 48; Newport, 40; Brattleborough and Poultney, 36; Post Mills, 30; Charlotte, 24 to 36.
Virginia.—Dale Enterprise, trace.
Washington Territory.—Port Angeles, 4; Spokane Falls, 3.
West Virginia.—Middlebrook, 4; Helvetia, 1.
Wisconsin.—Embarras, 42; Wausau, 25; Green Bay, 22; Fond du Lac, 14; La Crosse, 11; Delavan, 7; Franklin and Madison, 6; Milwaukee, 5; Prairie du Chien, 2.
Wyoming.—Fort Bridger, 1.

HAIL.

Hail fell in the various states and territories during the month on the following dates:
California.—Nicolaus, 6th, 12th, 21st; Los Angeles, 6th, 14th; Fall Brook, 7th; Benicia Barracks, 12th; Sacramento, 13th, 21st, 24th; San Francisco, 13th, 14th, 16th, 21st; Oakland and Oroville, 21st; San Diego, 16th.
Connecticut.—New London, 18th.
Dakota.—Parkston, 17th.
Illinois.—Windsor, 1st, 10th, 25th; Charleston and Mattoon, 10th; Pekin and South Evanston, 23d.
Indiana.—Vevay, 1st, 3d; Fort Wayne, 25th.
Iowa.—Keokuk, 8th; Cedar Rapids, 12th, 23d; Monticello, 17th.
Kansas.—El Dorado and Wakefield, 10th.
Kentucky.—Harper's Ferry, 26th.
Maine.—Cornish, 3d, 8th, 11th.
Maryland.—McDonogh, 2d; New Midway, 2d, 5th, 14th, 26th; Baltimore, 18th.
Michigan.—Swartz Creek, 5th; Grand Haven, 7th; Kalamazoo, 26th.
Missouri.—Centreville, 1st, 2d, 3d, 25th.
Nebraska.—Brownville, 6th, 10th; Tacoma and Tecumseh, 10th; North Platte, 17th.
New Hampshire.—Berlin Mills, 3d.
New Jersey.—Moorestown, 1st, 2d; Dover, 2d.

New York.—Brooklyn a, 1st, 22d, 26th; Fort Columbus and New York City, 2d; Brooklyn b, 2d, 22d; Setauket, 2d, 6th, 7th, 18th; Factoryville, 2d, 13th, 14th, 24th, 26th; West Point, 6th, 7th.
North Carolina.—Weldon, 5th.
Ohio.—College Hill and West Milton, 1st; Sandusky, 1st, 2d; Elyria, 1st, 2d, 10th; Jacksonborough, 1st, 14th, 18th, 20th; Yellow Springs, 18th; Garrettsville, 18th, 26th.
Oregon.—East Portland, 1st, 9th.
Pennsylvania.—Quakertown, 1st, 2d; Dyberry, 2d, 7th, 23d; Catawissa and Wellsborough, 2d, 26th; Pittsburg, 18th; Gram-pian Hills, 26th.
South Carolina.—Spartanburg, 14th.
Texas.—Cleburne, 3d; Silver Falls, 4th.
Virginia.—Bird's Nest, 5th; Dale Enterprise, 5th, 14th, 26th; Wytheville, 14th; Chincoteague and Brington, 23d.
Washington Territory.—Fort Townsend, 18th; Neah Bay, 24th.
Wisconsin.—Embarras, 5th; La Crosse, 6th; Delavan, 17th.
Wyoming.—Fort Washakie, 10th.

SLEET.

Sleet occurred in the various states and territories on the following dates:

Arizona.—Fort Bowie, 7th.
California.—Fort Gaston, 1st, 7th, 13th; Princeton, 6th, 21st.
Connecticut.—Bethel, 3d, 5th, 6th, 7th, 26th.
Dakota.—Huron, 17th.
District of Columbia.—Washington City, 2d, 14th.
Illinois.—Springfield, 1st, 2d; Cairo, 4th; South Evanston, 10th; Chicago and Geneseo, 11th.
Indiana.—Fort Wayne and Mauzy, 1st; Butlerville, 1st, 5th, 14th; Sunman, 1st, 5th; Indianapolis, 1st, 18th.
Indian Territory.—Fort Sill, 4th.
Iowa.—Clinton, 5th; Dubuque, 6th, 7th; Des Moines a and Oskaloosa, 10th; Des Moines b, 11th.
Kansas.—Globe, 4th; Fort Riley and Wakefield, 10th; Leavenworth, 10th, 11th; Salina, 10th, 15th, 24th.
Kentucky.—Louisville, 1st.
Maine.—Portland, 3d, 8th; Eastport, 3d, 18th, 19th, 24th.
Maryland.—Baltimore, 2d, 5th, 20th.
Massachusetts.—Wood's Holl and Boston, 2d, 3d; New Bedford, 6th, 7th, 8th, 18th.
Michigan.—Detroit and Mottville, 2d; Alpena, 7th; Fort Brady, 7th, 8th; Mackinaw City, 8th; Marquette, 14th.
Missouri.—Saint Louis, 1st, 4th.
Nebraska.—Crete, 5th; De Soto, 7th; Omaha, 10th; North Platte, 17th.
New Hampshire.—Manchester, 3d, 11th.
New Jersey.—Atlantic City, 1st; Beverly, 1st, 2d, 3d, 18th; Moorestown, 2d; Clayton, 2d, 6th.
New York.—New York City and Brooklyn, 2d; Oswego, 2d, 3d, 6th, 7th, 11th, 26th, 27th; Palermo, 3d, 6th, 7th, 8th, 11th, 24th, 28th; Fort Columbus, 3d, 6th, 8th, 22d; Albany, 2d, 3d, 8th, 26th; Buffalo, 6th, 7th; Palmyra, 6th; Le Roy, 7th, 11th, 18th, 27th; Factoryville, 14th; Setauket, 18th.
North Carolina.—Charlotte, 14th.
Ohio.—Cincinnati, Columbus, and West Milton, 1st; Cleveland, 1st, 2d; Wauseon, 1st, 2d, 5th, 14th, 18th, 23d, 26th; Garrettsville, 2d; Toledo, 2d, 3d.
Pennsylvania.—Pittsburg, 1st; Philadelphia, 1st, 2d; Erie, 2d; Phillipsburg, 2d, 6th, 14th; Wysox, 3d, 18th.
Rhode Island.—Narragansett Pier, 3d, 7th.
South Carolina.—Aiken and Charleston, 13th.
Tennessee.—Nashville, 3d, 4th; Memphis, 4th.
Texas.—Silver Falls and Midland, 3d; Abilene and Cedar Hill, 3d, 4th, 5th; Galveston, 4th; New Ulm, 27th.
Utah.—Salt Lake City, 16th.
Virginia.—Lynchburg, 5th, 14th, 15th; Variety Mills, 23d, 26th.
Washington Territory.—Walla Walla, 17th.
Wisconsin.—Milwaukee, 2d, 5th, 6th, 10th; Green Bay, 7th, 14th; Wausau, 18th, 26th.

Table of excessive and greatest monthly precipitation for February, 1887.

Station.	Specially heavy.		Largest monthly.	Station.	Specially heavy.		Largest monthly.
	Date.	Amt.			Date.	Amt.	
Alabama.				Indiana.			
Mount Willing.....	19 to 22	7.05	8.65	Vevay.....	2	2.00	8.28
Florence.....			7.66	Butlerville.....	2, 3	2.62	8.27
Montgomery.....	21	2.03	7.47	Jeffersonville.....	1, 2, 3	3.95	8.13
Roanoke.....	19 to 22	4.10	7.35	Sunman.....			7.45
Mount Vernon.....	19, 20, 21	4.30	6.93	La Grange.....	6, 7, 8	2.80	6.51
Mobile.....	21	4.22	6.62	Do.....	10, 11	2.34	
Marion.....			6.30	Mauzy.....			6.28
Tuscumbia.....			6.19	Fort Wayne.....	6, 7	2.25	
Valley Head.....			6.12	Do.....	10	2.00	
Bermuda.....	20	2.00		Iowa.			
Carrollton.....	19	2.17		Fort Madison.....	11	2.70	
Demopolis.....	19	2.65		Keokuk.....	10, 11	2.33	
Evergreen.....	19, 20	3.37		Kentucky.			
Eufaula.....	20	2.95		Louisville.....	2, 3	2.48	7.60
Gadsden.....	20	2.00		Louisiana.			
Greenville.....	21, 22	2.50		New Orleans.....	21	2.49	
Moultrie.....	21, 22	2.16		Maine.			
Oswichee.....	20, 21	2.32		Bar Harbor.....			7.29
Selma.....	19, 20	2.00		Kent's Hill.....			6.33
Tuscaloosa.....	19	2.75		Massachusetts.			
Troy.....	20, 21	2.27		New Bedford.....			6.73
Arkansas.				Newburyport.....			6.18
Little Rock.....	13, 14	2.50	6.42	Dudley.....	18	2.16	
Fort Smith.....	13, 14	2.45		North Truro.....	8, 9	2.00	
California.				Michigan.			
Cisco.....			22.85	Port Huron.....			7.86
Summit.....			20.70	Mottville.....			6.88
Emigrant Gap.....			18.80	Mississippi.			
Boca.....			12.70	Vicksburg.....	19, 20	2.53	
Newhall.....			12.38	Missouri.			
Auburn.....			12.38	Conception.....	10	2.00	
Truckee.....			12.25	Nevada.			
Towles.....			11.60	Fort McDermitt.....	14	2.14	7.35
Calistoga.....			11.18	New Brunswick.			7.60
Napa.....			10.68	Saint John.....			
Petaluma.....			10.43	New Hampshire.			
Delta.....			10.27	Woodstock.....			7.35
Fort Gaston.....	3, 4	3.68	9.96	Jacksonville.....			7.05
Santa Cruz.....			9.62	Townshend.....			6.60
Niles.....			9.44	New Jersey.			
Los Angeles.....	8, 9	2.06	9.25	New Brunswick a.....			6.74
Do.....	14, 15	3.94		Red Bank.....			6.49
Colfax.....			9.24	Imlaystown.....			6.45
San Francisco.....	4, 5	3.60	9.24	Paterson.....			6.26
San Mateo.....			9.17	New Brunswick b.....			6.15
Oroville.....	3, 4, 5	2.90	8.93	Locktown.....			6.15
Do.....	11, 12	2.95		Roseland.....	25, 26	2.53	6.11
Tehichipa.....			8.88	New York.			
Aptos.....			8.82	Humphrey.....			7.30
Fort Mason.....	3, 4, 5	5.60	8.80	Setauket.....			6.00
Cahuenga.....	9	2.55	8.72	Fort Columbus.....	26, 27	2.02	
Do.....	15	2.63		North Carolina.			
Angel Island.....	4, 5	4.79	8.77	Lincolnton.....	20, 21	2.32	
Santa Barbara.....			8.64	Ohio.			
Almaden.....			8.60	West Milton.....	17, 18	2.00	10.75
Hydesville.....	3, 4	2.98	8.48	College Hill.....	1, 2, 3	3.25	10.25
Redding.....			8.35	Do.....	26	2.25	
Oakland.....			8.01	Hiram.....	6, 7	2.13	9.56
Alcatraz Island.....	4, 5	3.60	7.85	Do.....	10, 11	2.17	
Oakland b.....			7.83	Portsmouth.....	1, 2, 3	4.69	9.28
South Vallejo.....			7.72	Sandusky.....	10, 11	2.98	8.53
Martinez.....			7.46	Elyria.....	10, 11	2.68	8.46
South Side.....			7.37	Cleveland a.....	10, 11	2.19	7.73
Spadra.....			7.36	Cleveland b.....	10, 11	2.16	7.54
Presidio of San Fr.....	5	2.80	7.32	Garrettsville.....			7.39
Templeton.....			7.21	Cincinnati.....	2, 3	2.98	7.28
Bonita Barracks.....	4, 5	3.42	7.17	Wauseon.....	10, 11	2.15	7.19
Elmira.....			7.10	Toledo.....			6.84
Santa Monica.....			7.07	Tiffin.....			6.68
Dunnigan.....			6.93	Tiffin b.....			6.60
San Jose.....			6.81	Columbus.....			6.48
Corning.....			6.81	Jacksonborough.....			6.25
Rocklin.....			6.77	Oregon.			
Nicolaus.....			6.75	East Portland.....			9.00
Knight's Landing.....			6.60	Astoria.....	28	2.11	8.51
Chico.....			6.53	Roseburg.....			6.24
Suisun.....			6.37	Fort Klamath.....	1, 2, 3	2.99	
Sacramento.....			6.28	Pennsylvania.			
Paso Robles.....			6.14	Franklin.....	10	2.18	9.24
Davis.....			6.14	Erie.....			8.50
Marysville.....			6.09	Grampian Hills.....			7.62
Connecticut.				Pittsburg.....	26	2.01	6.52
Middletown.....			7.56	Rhode Island.			
New Haven.....	18, 19	2.43	6.22	Block Island.....			7.02
Voluntown.....			6.20	Olneyville.....			6.46
Waterbury.....			6.07	Narragansett Pt.....			6.28
Illinois.				South Carolina.			
Makanda.....	2, 3	2.00	9.83	Pacolet.....	1	2.73	
Do.....	5	2.00		Tennessee.			
Pulley's Mill.....	2, 3	3.15	6.91	Riddleton.....	2, 3	3.89	13.08
Waukegan.....	17	4.00	6.80	Do.....	14	2.46	
Pekin.....	10, 11	2.00	6.68	Austin.....	2, 3	3.57	12.57
Onida.....			6.55	Do.....	23		
Monmouth.....	10, 11	2.40	6.50	Dickson.....	2, 3	3.10	11.80
Rockford.....			6.44	Do.....	14	2.39	
Flora.....			6.24	Do.....	23	3.01	
Aledo.....	17	2.19	6.24	Waverly.....	14, 15	2.33	9.71
Fairview.....	10, 11	3.12	6.12	Do.....	23, 24	2.10	
Pana.....			6.08	Careyville.....	18, 19	2.10	9.05
Peoria.....	10, 11	2.89		Do.....	23	2.22	
Riley.....	8	2.06		Rogersville.....	2, 3	3.30	8.93
Kankakee.....	11	2.50		Woodstock.....	2, 3	2.45	8.88
Minonk.....	10	2.60		Do.....	14	2.30	
				Nashville.....	14	2.41	8.47
				Memphis.....	13, 14	2.35	8.37

Table of excessive and greatest monthly precipitation for February—Cont'd.

Station.	Specially heavy.		Largest monthly.	Station.	Specially heavy.		Largest monthly.
	Date.	Amt.			Date.	Amt.	
Tennessee—Con.				Tennessee—Con.			
Taunton.....	14	2.81	8.23	Milan.....	13, 14	2.64	6.75
Beech Grove.....	23, 24	3.61	8.03	Hurricane Switch.....			6.71
Florence.....	23	2.18	7.98	Knoxville.....			6.67
Sailor's Rest.....	1, 2	2.00	7.62	Parksville.....	14	2.00	
Fayetteville.....			7.54	Virginia.			
Cookeville.....	23	2.25	7.48	Marion.....	2, 3	2.15	
Savannah.....			7.41	Washington Ter.....			
Manchester.....	23	2.51	7.33	Tatoosh Island.....	26, 27, 28	6.02	11.30
Ashwood.....			7.20	Pysh.....	27, 28	3.63	8.91
Chattanooga.....			7.16	Neah Bay.....			7.20
Grief.....	15	2.05	7.14	Fort Canby.....	28	2.18	6.29
Waynesborough.....			7.10	West Virginia.			
Fostoria.....	17	2.00	7.00	Helvetia.....	2, 3	2.42	7.68
Covington.....	14	2.50	6.88	Wisconsin.			
Andersonville.....	23, 24	2.72	6.83	Wausau.....	18	2.23	

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for February, 1887.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
	o	o	o		o
Alpena, Michigan a.....	40.0	35.2	4.8	12.1	38.2
Baltimore, Maryland.....	34.5	31.0	3.5	22.4	28.9
Boston, Massachusetts.....					
Buffalo, New York a.....	42.0	38.0	4.0	14.9	34.4
Canby Fort, Washington Territory.....	75.7	58.6	17.1	7.9	65.8
Cedar Keys, Florida.....	58.1	51.1	7.0	36.2	56.7
Charleston, South Carolina b.....	47.7	37.0	10.7	2.8	41.9
Chincoteague, Virginia.....	36.5	32.0	4.5	13.0	31.6
Cleveland, Ohio c.....					
Detroit, Michigan a.....					
Duluth, Minnesota a.....	37.0	35.1	1.9	13.3	20.6
Eastport, Maine.....					
Escanaba, Michigan a.....	67.8	60.2	7.6	13.2	62.9
Galveston, Texas.....	32.5	31.9	0.6	19.1	24.1
Grand Haven, Michigan d.....	58.3	59.5	8.8	18.0	64.4
Jacksonville, Florida.....	80.1	74.6	5.5	18.5	73.4
Key West, Florida.....					
Mackinaw City, Michigan a.....					
Marquette, Michigan a.....					
Milwaukee, Wisconsin.....	57.1	47.3	9.8	15.7	62.5
Mobile, Alabama.....	37.5	34.5	3.0	10.5	31.5
New London, Connecticut.....	26.9	32.2	4.7	14.7	33.7
New York City.....	56.5	43.2	7.3	16.0	46.7
Norfolk, Virginia.....	67.3	57.3	10.0	17.8	63.3
Pensacola, Florida.....	34.5	29.6	4.9	16.5	22.2
Portland, Maine.....	42.0	32.3	9.7	53.1	31.9
Portland, Oregon.....					
Sandusky, Ohio a.....					
Toledo Ohio c.....	38.3	32.9	5.4	16.2	29.2

a Frozen throughout the month.

b Record for 27 days.

c Record for 7 days; lake frozen during remainder of month.

d Record for 21 days.

e Record for 19 days; lake frozen during remainder of month.

WINDS.

The most frequent directions of the wind during February, 1887, are shown on chart ii by the arrows flying with the wind; they are also given in the table of miscellaneous data. In New England, the Lake region, the upper Mississippi valley, the Missouri Valley, Dakota, and Minnesota, the wind blew generally from the west or northwest; in the Gulf States the prevailing direction was from the south; in the middle plateau from the southwest. In other parts of the country the wind was variable.

HIGH WINDS.

[In miles per hour.]

Wind-velocities of fifty or more miles per hour, other than the maximum velocities for the month, which are given in the table of miscellaneous data:

Mount Washington, New Hampshire, 54, nw., 1st; 58, nw., 3d; 71, w., 5th; 63, nw., 6th; 101, w., 8th; 100, w., 9th; 72, w., 10th; 76, sw., 11th; 78, nw., 12th; 82, nw., 13th; 60, w., 14th; 100, w., 15th; 51, w., 16th; 74, nw., 17th; 76, se., 18th; 92, nw., 19th; 86, nw., 20th; 60, sw., 22d; 72, nw., 23d; 119,